



DEPARTMENT OF MINING ENGINEERING AND MINE SURVEYING

SUBJECT : SITE SURVEYING 2A
CODE : SSSVMSA2
DATE : 29 MAY 2018
DURATION : 180 MINUTES (12:30 – 15:30)
WEIGHT : 40 : 60
TOTAL MARKS : 100

ASSESSOR : MS Z MDLULI
MODERATOR : MR KS PHOGOLE
NUMBER OF PAGES : 4 + 2 ADDENDUMS

INSTRUCTIONS TO STUDENTS

1. ONLY ONE POCKET CALCULATOR PER CANDIDATE MAY BE ALLOWED.
 2. NUMBER QUESTIONS CLEARLY.
 3. SHOW ALL CHECKS.
 4. ANSWER TO THREE DECIMAL PLACES UNLESS SPECIFIED OTHERWISE.
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QUESTION 1 (10 Marks)

1. The definition of a curve is:

- a. A line that gradually deviates from being straight for some or all of its length forming an arc.
- b. A line that gradually deviates from being bent for some or all of its length forming a straight.
- c. A line that abruptly deviates from being straight for some or all of its length forming a corner.
- d. A line that does not deviate from being straight.
- e. A line that abruptly deviates from being bent for some or all of its length forming a straight.
- f. None of the above

2. The definition of a prismoid is:

- a. A solid having two **parallel end faces**, consisting of polygons not necessarily having the same number of sides.
- b. A solid having multiple **parallel end faces**, consisting of polygons not necessarily having the same number of sides.
- c. A solid having two **parallel end faces**, consisting of polygons having the same number of sides.
- d. A solid having no **parallel end faces**, consisting of polygons not necessarily having the same number of sides.
- e. A solid having two **parallel end faces**, consisting of polyhedrons not necessarily having the same number of sides.
- f. A solid having three **parallel end faces**, consisting of polygons not necessarily having the same number of lengths.

3. The definition of an error is:

- a. A measure of the estimated difference between the calculated value of a quantity and its true value.
- b. A measure of the calculated difference between the estimated value of a quantity and its true value.
- c. A misclosure that is distributed in proportion to the distance travelled, with the sign of the adjustment being the same to that of the misclosure.
- d. A measure of the calculated similarity between the estimated value of a quantity and its false value.
- e. A misclosure that is distributed in disproportion to the distance travelled, with the sign of the adjustment being opposite to that of the misclosure.
- f. A measure of the estimated difference between the calculated value of a quantity and its false value.

4. In the process of staking out curves, the formula used to calculate the mid-ordinate is given as:

- a. $m = R * T (1 - \cos \frac{I}{2})$
- b. $m = R * T (1 + \cos \frac{I}{2})$
- c. $m = R(1 - \cos \frac{I}{2})$
- d. $m = T (1 - \cos \frac{I}{3})$
- e. $m = T (1 + \cos \frac{I}{3})$
- f. None of the above

5. In a circle, formula to calculate the area of a sector is:

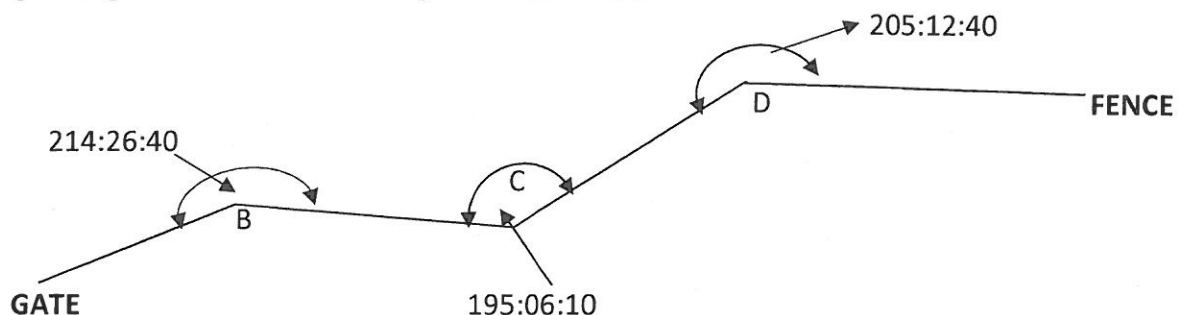
- a. $A = \frac{R^2 \theta}{3} (\theta \text{ in radians})$
- b. $A = \frac{R^2 \theta}{2} (\theta \text{ in radians})$
- c. $A = \frac{R^2 \theta}{3} (\theta \text{ in degrees})$
- d. $A = \frac{R^2 \theta}{3} * \pi (\theta \text{ in radians})$
- e. $A = \frac{R^2 \theta}{2} * \pi (\theta \text{ in radians})$
- f. None of the above

Question 2 (20 Marks)

From the information below:

- a) Traverse for the stations B, C, D, and FENCE
- b) Correct the linear closing error using Bowditch's Rule

[GATE] 2593.540 ; -3941.837
[FENCE] 2029.879 ; -3746.193



HD

GATE – B = 120.900m Direction Gate – B = 245:00:00
B – C = 190.460m
C – D = 150.320m
D – FENCE = 200.450m

QUESTION 3 (30 Marks)

The following observations were taken over ground through which a furrow 3.0m wide with vertical sides is to be cut. The furrow will slope at an even grade between station 1 and 12. Observations at Peg J and M were taken under a bridge in the route of the proposed furrow.

STATION	START +	BS	IS	FS	ELEVATION
Peg J	start +0	1.375			217.350
1	start +0		1.625		
2	start + 8		1.678		
3	start + 16		1.731		
4	start + 24	1.404		1.785	
5	start + 32		1.457		
6	start + 40		1.510		
Peg M	start + 48	1.913		1.659	
7	start + 48		1.597		
8	start + 56		1.654		
9	start + 64		1.712		
10	start + 72		1.769		
11	start + 80		1.826		
12	start + 88			1.883	213.397

Material from the furrow is to be used to metal a circular portion of a foot path to an average depth of 20cm throughout. If the path is 1m wide with an inner radius of 900m, calculate the angle bounded by two radii if all the material is used to metal the road.

Question 4 (20 Marks)

Two straights intersecting at point B have the following bearings:

$\alpha_{BA} = 270:00:00$ chainage = 1km

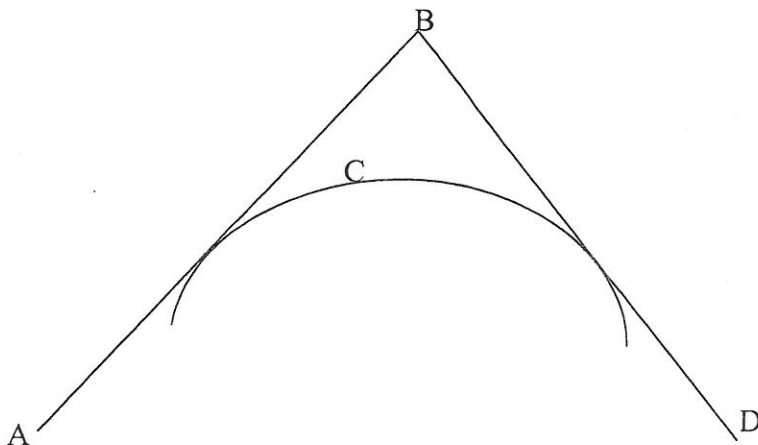
$\alpha_{BD} = 110:00:00$

They are joined by a circular curve which must pass through a point C which is 150m from B and the bearing of BC = $260:00:00$

Calculate:

4.1 The required radius of the proposed curve

4.2 The data required for the setting out of the curve by 90m standard chords



BOWDITCH CORRECTION

[illegible]

SURNAME & INITIALS: _____

[illegible]